

ABSTRACT OF THE DISCLOSURE

Tantalum and titanium source reagents are described, including tantalum amide and
5 tantalum silicon nitride precursors for the deposition of tantalum nitride material on a
substrate by processes such as chemical vapor deposition, assisted chemical vapor
deposition, ion implantation, molecular beam epitaxy and rapid thermal processing. The
precursors may be employed to form diffusion barrier layers on microelectronic device
structures enabling the use of copper metallization and ferroelectric thin films in device
10 construction.